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IN SOUTHEAST ARKANSAS, 1950

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By

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In 1940 the Southern Forest Experiment Station made a study of pulpwood production costs in southeast Arkansas.1/ World War II significantly altered these costs, and the study was repeated in 1945.2/ By 1950, continued inflation, the use of bigger trucks, and the introduction of power saws, pallet loading systems, and tractors had made the 1945 data obsolete, so that a third study was made in the fall of 1950.

The 1950 study was carried out in Ashley, Bradley, and Drew counties of southeast Arkansas, as were the previous studies. In all three studies only dry-weather logging conditions were sampled. Production under winter or wet-weather conditions is bound to be somewhat different and costs higher.

In the 1950 study one pulpwood contractor was selected at random in each of nine designated areas of the three counties. Each was visited in the woods and a record was made of equipment, manpower, and methods used, costs of equipment and manpower, hours worked by each crew or portion of a crew, number of cords of wood produced per day, number of loads hauled per day, loading and unloading time and method, distance of haul, and time required per trip. In short, information was collected on every item that would enter into the cost of producing pulpwood.

1/ Reynolds, R. R. Pulpwood and log production costs as affected by type of road. Southern Forest Experiment Station, Occasional Paper 96. 1940.

2/ Reynolds, R. R. Pulpwood and log production costs in 1945 as compared with 1940. Southern Forest Experiment Station, Occasional Paper 107. 1945.

Contractors keep few records and do not have costs for equipment depreciation, insurance, and crew transportation, although they do know how long the average piece of equipment lasts and the average time it is in use each day or each week. Fixed expenses, including depreciation, have therefore been computed from the best general experience data.

At one time pulpwood cutters and contractors thought an operation unprofitable unless the cut per acre was at least two cords. They also considered it generally unprofitable to cut pulpwood from tops of sawtimber trees. In 1950, however, the average production per acre for the nine contractors was approximately 1.0 cord and at least 50 percent of the cut came from tops of sawlog trees. Most of the pulpwood was cut on lands belonging to large timber companies.

The selection method of cutting of standing trees was used, removing defective, very rough, forked, or badly suppressed trees for pulpwood. Usually only trees below 10 inches in diameter were cut for pulpwood. Trees of larger sizes were cut into sawlogs. All timber to be removed was marked before cutting.

Felling and Bucking

Up until about 1943 all trees were felled and bucked into pulpwood by hand labor. Two-man crosscut saws were generally employed, although some one-man bow saws were used where the timber was mostly below 8 inches d.b.h. Chain saws were introduced in about 1945 and met with varied success in the early years. Now they are part of the standard equipment of nearly every contractor and two-man crosscut saws are rarely used.

Chain saws, however, have not taken over the entire felling and bucking job. Most contractors have found that small standing trees can be felled and bucked into pulpwood lengths most cheaply with one-man bow saws. It is customary for the contractor first to send bow saw crews through the stand to cut the small marked trees up to about 8 inches in diameter, and then to have chain saw crews follow immediately to cut the larger trees. One chain saw crew to 5 to 10 bow saws is the usual combination.

Bow saw cutters are paid either by the hour or by the amount of wood they cut. When on an hourly basis they generally are paid $0.75 per hour and are covered by social security, workmen's compensation, and industrial insurance. Hourly rate employees are furnished saws, axes, and other tools, which are maintained by the contractors. When bow saw cutters work on a task or contract basis, they are paid from $0.90 to $1.00 per 6-foot pen of wood. Contract cutters generally furnish and maintain their own tools, although the contractors pay social security and other benefits for them.

The average production for the bow saw cutters is 8 pens of 5-foot wood per man per day. The timber is small, generally running from four to five 6-foot pens of wood per standard cord, and the average production per 8-hour day is from 1.6 to 2.0 cords. Wood produced by the bow saws, therefore, costs from $4.28 to $5.39 per standard cord, depending on the average size and wage rates.

Although several of the 13 chain saws in use by the 9 pulpwood contractors are supposed to be one-man saws, some of the contractors have found the work heavy enough so that they are using two men on a one-man saw. The two additional men that make up the usual four-man chain saw crew limb the trees felled by the saw crew, and also the tops of the sawlog trees that are to be cut. They help get the saw out of pinches and sometimes aid in felling standing trees.

All chain saws used on the various jobs were of the bow type. All contractors except one reported that the chain saws were expensive to operate. Perhaps because of poor operation procedures, some sprockets were good for only 20 to 40 cords. Chains, which cost $27.00 each, sometimes lasted for only about 100 cords of wood.

The estimated cost of operating the average chain saw was $0.87 per standard cord (appendix table 8). This is exclusive of operating labor. Cost of chain-saw crew labor averaged $0.805 per man-hour--plus social security, workmen's compensation, and insurance. With a cost of $0.036 per man-hour for social security and industrial insurance, $0.042 for workmen's compensation, $0.070 for supervision, and $0.063 for crew transportation, the total cost per man-hour was $1.016 or $8.128 per 8-hour day. Total cost per 8-hour day for the four-man crew was, therefore, $32.51. Average production for the crews studied was 10.8 cords. Labor, therefore, costs $3.01 per cord. Adding $0.87 per cord for the cost of the saw makes the total net cost $3.88 per cord.

Average net felling and bucking cost for pulpwood produced by all contractors was $4.20 per cord (table 1). If 20 percent is allowed for profit and risk, the average net cost becomes $5.04 per standard cord. In connection with these figures (table 1) it is of interest to note that the two contractors with lowest production costs used chain saws exclusively--but so did the two contractors having the most expensive wood. The differences are accounted for by the amount of wood cut per acre and the amount taken from tops of sawlog trees.

Table 1.--Pulpwood felling and bucking cost per cord, by contractors

Contractor	Men in crew	Labor	Power saw	Supervision	Crew transportation	Social security, unemployment ins., workmen's comp.	Total	Total cost plus 20 percent	Total cords produced per day
	Number	Dollars							Cords
1	9	1.80	0.87	0.17	0.07	0.18	3.09	3.71	30.0
2	6	2.57	.62	.24	.38	.26	4.07	4.88	14.0
3	15	3.62	.27	.26	.30	.32	4.77	5.72	32.0
4	14	2.97	.59	.24	.10	.28	4.18	5.02	32.7
5	6	3.58	.87	.14	.12	.25	4.96	5.95	24.0
6	4	1.60	.87	.15	.25	.16	3.03	3.64	15.0
7	11	3.33	.25	.27	.26	.32	4.43	5.32	22.5
8	7	3.13	.87	.26	.35	.30	4.91	5.89	15.0
9	7	3.00	.50	.28	.20	.31	4.29	5.15	14.0
Weighted average		2.90	.61	.22	.20	.27	4.20	5.04	

Skidding or Bunching

Under dry-weather conditions during the years up to about 1945, most of the pulpwood was loaded directly from the ground or pen to the truck that hauled it to the mill or railroad car. Any necessary bunching was done with one or two horses and a slide or wagon. In 1950, however, there were almost as many different bunching and loading systems as there were contractors. Two contractors were using a pallet system. One loaded the pallets in the woods by use of a special slide and Caterpillar D-2 and D-4 tractors. The other bunched the wood with a team and wagon and loaded the pallets on the road. Some contractors loaded most of their wood directly by hand onto the trucks (which were driven into the woods) and bunched only the scattered wood. Some used teams and wagons for this bunching, and some used tractors and special heavy iron slides. One contractor did not bunch any of his wood but loaded all of it directly onto the trucks.

One contractor who had very reasonable bunching, loading, and hauling costs bunched all of his wood with an International TD-9 tractor and a special iron slide that held approximately 2.3 cords of wood--a good 1½-ton truckload. Each slide load was skidded to some woods road or point easily accessible to the trucks. At this spot a specially adapted Loggers Dream loader equipped with cable slings raised the whole

load high enough to permit a truck to back directly under. If no truck was at hand the load was picked off the slide and left swinging in the air. As soon as a truck arrived, the supervisor or one of the bunching crew helped the truck driver lower the load onto the truck. After the load was on the truck it was necessary to straighten a few sticks and level the load somewhat, but the whole loading operation was accomplished in less than 15 minutes.

Only the two contractors using the pallet systems and the one using the Loggers Dream method of loading bunched all of their pulpwood prior to hauling. The others bunched only wood--about 10 to 30 percent--that was scattered or in places hard to get to with a truck.

Cost of bunching has been computed for each contractor. The costs are based on the number of men, the number and size of tractors and other equipment, and the number of hours the manpower or equipment was used each day. Use was made of the machine rates shown in appendix tables 9 and 10.

Because only a small proportion of the wood is bunched during dry weather, the average bunching cost was only $1.16 per cord (table 2). This average, of course, includes some producers who bunch all of their wood and some who bunch little or none.

The figures on skidding or bunching costs do give some indications of the additional cost that applies any time that ground conditions are such that all wood must be bunched to a road. The average cost for those contractors who bunch all of their wood was $2.47 per cord. It seems reasonable to expect, therefore, that the cost of the wood during wet weather should be the difference between what the various contractors are spending for bunching in dry weather and $2.47. The average dry-weather bunching cost for those contractors who are not using pallet systems is $0.50 per cord. Wet-weather costs, therefore, probably will be close to $2.00 per cord more than dry-weather costs.

Loading and Hauling

There is a very definite change away from the use of small and light trucks toward the use of larger and more powerful ones for the hauling of pulpwood. At the time of the two previous studies practically all trucks were of the 1½-ton, 85-horsepower variety. Out of a total of twenty-three trucks in use in 1950, however, nine were in the 2-ton class and two were 2½-ton. Largely as a result of this increase in truck size the average load of wood increased in volume from 1.98 standard cords in 1940 and 1945 to 2.47 cords in 1950.

Table 2.--Pulpwood skidding or bunching cost per cord

Contractor	Men in crew	Hours per day	Labor cost 1/	Team or machine hours	Team or machine rate per hour	Machine cost	Cable, slides, etc.	Supervision 2/	Crew transportation cost	Total cost	Total cords produced	Cost per cord
	- Number -		Dollars	Number	- - - - - - - - - Dollars - - - - - - - - -						Cords	Dollars
1	...	...	...	...	...	...	...	...	...	...	30.0	...
2	1½	8	9.92	8	0.438	3.50	1.00	0.84	1.33	16.59	12.0	1.38
3	4	2	7.66	2	2.76	5.52	.50	.51	.64	14.83	30.0	.49
4	3½	8	27.53	6	2.76	16.56	.50	1.77	.81	47.17	27.0	1.75
5	3/ 7	8	46.28	3	2.40	21.00	1.00	3.54	3.45	75.27	22.8	3.30
				5	2.76							
6	4	2	6.61	2	2.76	5.52	.50	.51	.92	14.06	15.0	.94
7	3	1	2.48	1	2.76	2.76	.06	.19	.20	5.69	25.0	.23
4/8										36.00	14.4	2.50
5/9										11.55	14.0	.82
Total			100.48			54.86	3.56	7.36	7.35	221.16	190.2	1.16
Cost per cord other than contracts			.62			.34	.02	.05	.05			1.08

1/ Including social security and compensation.
2/ $0.56 per man-day.
3/ One D-4 and one D-2 tractor used.
4/ Contract at $2.50 per cord.
5/ Contract 4.2 cords per day at $2.75.

The average distance over which the wood is hauled has also increased in the last few years. Previously, the average one-way haul was about 8 miles. Now it averages just under 15 miles.

In 1940 most truck tires were 32 by 6. In 1945 most trucks had 7.50 by 20 tires on the front and 8.25 by 20 on the rear wheels. Many tires in 1950 were still 8.25 by 20, but some were 9.00 by 20 and larger.

As has been indicated previously, most of the loading of the trucks is still by manpower. Some contractors have tried mechanical loading and have found that hand-loading is the cheapest. Perhaps it is, even though it requires approximately 35 minutes to complete the average load as contrasted to 15 minutes for the pallet and Loggers Dream loading.

Trucks worked an average of 9.11 hours per day in 1950. Of this, 1.71 hours were spent in loading, 3.55 hours in hauling, 1.34 hours in unloading, and 2.51 hours in delay.

Pulpwood loading and hauling cost was computed in the following manner:

Loading labor.--Used exclusively for loading (except the driver). The number of hours worked per day and the rate paid per hour were obtained from the contractors. Total labor cost plus social security, industrial insurance, and workmen's compensation was divided by the total amount of wood produced per day to get the loading labor cost per cord.

Truck costs.--These costs were computed from machine rates (appendix tables 11 and 12) that were themselves computed from average experience data on cost of trucks, average life, cost of repairs, sale values for used trucks, and average operating costs. Truck costs were broken down into fixed cost and operating cost. The former is based on the amount required per year for interest on the investment, license, taxes, and depreciation. This cost was charged against the truck for each day of operation regardless of the miles traveled. In effect, it was charged against the operation whether the truck was standing still, being loaded, or was traveling down the highway. Operating costs, on the other hand, were only charged when the truck was traveling. The amount charged depended upon the size of the truck, the number of miles traveled, and the size of the load.

Truck driver.--This cost was charged separately from other costs. It was arrived at by dividing the total cost of the driver per day, including social security and other extras, by the number of cords hauled.

Supervision.--As will be explained later, supervision was charged at so much per man hour of labor used in loading or hauling on the various jobs.

Crew transportation.--As will also be explained later, this is the cost of picking up the men in the morning, transporting them to the work site, and taking them home at night. The total cost for the men used in the loading and hauling crews divided by the number of cords produced per day gave the cost per cord.

The cost per cord for loading and hauling the wood averaged $3.92 (table 3), exclusive of any charge for profit and risk. The three contractors with mechanical loading devices had unusually low loading and hauling costs, but their advantage here is largely offset by the high cost of bunching the wood.

Table 3.--Pulpwood loading and hauling cost per cord

Contractor	Loading labor cost	Other loading cost	Truck fixed cost	Truck hauling cost	Truck driver cost	Supervision	Crew transportation	Total cost
	Dollars							
1	2.20	...	0.64	0.94	1.10	0.28	0.11	5.27
2	1.10	...	.64	1.96	1.10	.19	.30	5.29
3	1.02	...	.61	1.56	1.02	.15	.17	4.53
4	...	0.33	.29	.74	.69	.04	.02	2.11
5	(1/)	...	.65	1.43	.76	.05	.04	2.93
6	.88	...	.56	1.49	.88	.15	.25	4.21
7	.79	...	.55	1.89	.79	.13	.13	4.28
8	(1/)	...	.55	1.30	.46	...	...	2.31
9	.94	...	.55	1.46	.94	.16	.11	4.16
Weighted average	.82	.05	.56	1.37	.87	.13	.12	3.92

1/ Pallet system used. No labor except driver needed.

Crew Transportation

During and after World War II much of the country labor either left the State or moved to the towns. Woods workers became scarce and those available lived long distances from the woods operations. To get sufficient laborers, contractors in 1950 had to furnish good transportation and sometimes haul the men 20 to 30 miles to the job. Thus, the beginning of the "work truck" and the need for charging crew transportation against the cost of producing pulpwood.

The average contractor drives his work truck 43.7 miles per day in transporting his crew to and from the job. The cost of the truck per mile of operation (appendix table 13) is $0.103. The cost of the driver is $0.045 per mile. The total cost of the crew transportation is $0.505 per man-day of labor transported, or $0.340 per cord of wood produced (table 4).

Table 4.--Crew transportation cost per man-day

Contractor	Work truck miles traveled per day	Truck cost per day 1/	Driver hours	Driver cost per day 2/	Total truck and driver cost	Men transported	Cost per man-day	Cost per cord
	Miles	Dollars	Hours	Dollars		Number	Dollars	
1	37	3.81	1.5	1.69	5.50	24	0.229	0.183
2	60	6.18	2.4	2.70	8.88	10	.888	.740
3/3	100	10.30	4.0	4.50	14.80	23	.643	.493
4	25	2.58	1.0	1.12	3.70	16	.231	.137
5	30	3.09	1.2	1.35	4.44	9	.493	.195
6	50	5.15	2.0	2.25	7.40	8	.925	.493
7	60	6.18	2.4	2.70	8.88	17	.522	.355
8	40	4.12	1.6	1.80	5.92	8	.740	.411
9	35	3.60	1.4	1.58	5.18	13	.398	.370
Total	437	45.01		19.69	64.70	128		
Average	43.7	4.50		1.97	6.47	12.8	.505	.340

1/ At $0.103 per mile.
2/ At $1.125 per hour. No social security, workmen's compensation, or unemployment insurance included.
3/ Used two trucks.

Supervision

Contractors with small crews usually supervise the whole job themselves. Those with larger operations hire a man for the purpose but also often spend all or a portion of their own time in supervision. In this cost study, each man who worked at supervising the various crews and equipment was assumed to be performing a necessary function, and his time was charged against the wood production cost at $8.00 per day. Dividing the total amount charged for supervision for all contractors by the total number of men employed by all contractors gave $0.56 as the cost per man-day of labor employed. This is the rate used in all tables.

This report would be incomplete without one comment upon the subject of supervision. Some contractors feel that they can put crews in the woods, tell them what to do, and then go away and forget them for long periods of time. Production always suffers on such jobs. By observing the closeness and character of the supervision on each job, one was able to forecast very accurately what the relative production costs would be. Contractors who have small crews and give close supervision undoubtedly produce cheaper wood and make more money than many of those having large, poorly supervised labor forces.

Total Production Costs

Total net costs of producing pulpwood varied from $8.04 to $11.19 per standard cord and averaged $9.28 (table 5). If 20 percent of net cost were allowed for profit and risk the variation would be from $9.65 to $13.43 and would average $11.14 per standard cord. When computed for a uniform 15-mile haul for all jobs, the cost of producing the wood, plus 20 percent for profit and risk, ranges from $9.79 to $13.39 and averages $11.43 per standard cord.

Table 5.--Pulpwood production cost by contractors--dry weather conditions, 1950

Contractor	Felling and bucking	Skidding or bunching	Loading and hauling	Total net cost	Net cost plus 20 percent: For actual haul	Net cost plus 20 percent: For 15-mile haul 1/
	Dollars					
1	3.09	...	5.27	8.36	10.03	11.93
2	4.07	1.38	5.29	10.74	12.89	12.94
3	4.77	.49	4.53	9.79	11.75	11.30
4	4.18	1.75	2.11	8.04	9.65	11.03
5	4.96	3.30	2.93	11.19	13.43	13.39
6	3.03	.94	4.21	8.18	9.82	9.79
7	4.43	.23	4.28	8.94	10.73	10.09
8	4.91	2.50	2.31	9.72	11.66	11.39
9	4.29	.82	4.16	9.27	11.12	11.18
Weighted average	4.20	1.16	3.92	9.28	11.14	11.43

1/ If all contractors hauled over same road conditions and made the same speed.

Costs for Various Lengths of Haul

In the area of the study, trucks of three different sizes each carried different average loads per trip over different lengths of haul. Table 6 shows what the cost would be for 1½- and 2-ton trucks carrying given average loads of wood over distances varying from 5 to 20 miles.

Table 6.--Pulpwood production cost per cord for various lengths of haul[1/] and various loads--1½- and 2-ton trucks. Dry weather only

Length of haul[2/] (miles)	Loading and hauling cost: 1½-ton truck: 2.25 cords per load	1½-ton truck: 2.50 cords per load	2-ton truck: 2.75 cords per load	2-ton truck: 3.00 cords per load	Total cost[3/]: 1½-ton truck: 2.25 cords per load	1½-ton truck: 2.50 cords per load	2-ton truck: 2.75 cords per load	2-ton truck: 3.00 cords per load
	Dollars							
5	4.06	3.78	4.00	3.77	9.96	9.68	9.90	9.67
7½	4.51	4.20	4.40	4.15	10.41	10.10	10.30	10.05
10	5.08	4.70	4.91	4.61	10.98	10.60	10.81	10.51
12½	5.58	5.15	5.36	5.02	11.48	11.05	11.26	10.92
15	6.11	5.63	5.82	5.45	12.01	11.53	11.72	11.35
17½	6.61	6.08	6.26	5.84	12.51	11.98	12.16	11.74
20	7.13	6.55	6.70	6.25	13.03	12.45	12.60	12.15

1/ Based on net cost plus 20 percent for profit and risk.
2/ Mainly over first-class roads.
3/ Including $5.04 per cord for felling and bucking and $0.86 per cord for bunching or skidding, excluding pallet systems.

For short hauls there is apparently little to choose between 1½-ton trucks carrying loads averaging 2.25 cords per load and 2-ton trucks carrying 2.75 cords per load, or between 1½-ton trucks carrying 2.50 cords as compared to 2-ton trucks carrying 3 cords. For the longer hauls, however, the 2-ton trucks and the larger loads produce the cheaper wood.

There is little question but that for hauls over 15 miles, still larger trucks would be cheapest, but then bunching all the wood to the road or central loading point would be necessary. Trucks larger than 2-ton are very difficult to maneuver through the woods.

Comparison of 1940, 1945, and 1950 Costs

Who will remember delivering pulpwood to the railroad car or pulp mill for $3.45 per standard cord? It sounds quite impossible. Yet, ten short years ago, that was the cost for wood hauled 8 miles. Even five years ago the cost was $7.23 per standard cord. Today the cost averages $11.14 per standard cord, though the average load is hauled somewhat farther.

Over the last 10 years, felling and bucking cost has gone up 198 percent. The cost of bunching, loading, unloading, and delay has risen 269 percent, and hauling cost is up 227 percent. The total average cost of delivering wood today is 223 percent more than it was ten years ago--in short, it has more than tripled.

Manpower efficiency in 1945 was lower than in 1940, but efficiency in 1950 was again up to the level of 1940. Trucks and other equipment are undoubtedly better than in 1940. The tremendous increase in pulpwood production cost over the last 10 years, therefore, can practically all be charged to greatly increased wages, and to cost of equipment. Only a very small percentage of it can be charged to increased length of haul.

Table 7.--Comparison of 1940, 1945, and 1950 pulpwood production costs per standard cord[1/], dry weather conditions

Item	Cost			Percent increase over 1940	
	1940	1945	1950	1945	1950
	--- Dollars ---			- Percent -	
Felling and bucking[2/]	1.69	3.69	5.04	118	198
Bunching, loading, unloading, delay	.81	1.52	2.99	88	269
Hauling[3/]	.95	2.02	3.11	113	227
Total	3.45	7.23	11.14	110	223

1/ Computed at cost plus 20 percent for profit and risk.
2/ Wood cut in 5-foot lengths.
3/ In 1940 and 1945 average length of haul 8 miles, in 1950 average length of haul 15 miles.

Appendix

Table 8.--Estimated costs: one-man chain saw used to produce pulpwood

	Dollars
Investment	
Saw complete with bow and chain	441.58
	Costs per cord Dollars
Fixed expenses	
Interest on investment or carrying charge at 7 percent[1/]	0.01
Depreciation[2/]	.22
Maintenance--labor	.20
Maintenance--parts	.25
Risk or insurance	.02
Gasoline, oil, wedges, etc.	.17
Total per cord	0.87

1/ On one-half of original investment.
2/ Life 1 year or 2,000 cords or 200 days.

Table 9.--Estimated costs for Loggers Dream used to load pulpwood

	Dollars
Investment	
Loader complete with cable and pulleys	3,450.00
Less trade-in value	- 600.00
Total amount to be depreciated	2,850.00
Fixed expenses	
Interest on investment[1/] or carrying charge at 7 percent	158.38
License and taxes per year	59.00
Insurance or risk	123.00
Total fixed expenses per year	340.38
Fixed expenses per day (200 days per year)	1.70
Depreciation of truck per day--life = 1,200 days	2.38
Total fixed expenses per day (8-hour day)	4.08
Running expenses per day	
Tires	.50
Gasoline	.84
Oil and grease	.45
Repair labor	1.00
Repair supplies, cable, etc.	2.00
Total	4.79

1/ Average investment = $\frac{\text{initial investment} + \text{trade-in value}}{2}$ + $\frac{\text{annual depreciation}}{2} = \frac{\$3,450.00 + \$600.00}{2} + \frac{\$475.00}{2} = \$2,262.50$

Table 10.--Machine rate for tractors

Item	Caterpillar: D-2 or equal	International: TD-9 or equal
	Dollars	Dollars
Investment		
Tractor complete with radiator and oil pan guards, bumper, pull hooks, side panels, and starter motor	4,400.00	5,100.00
Less trade-in	- 600.00	- 800.00
Amount to be depreciated	3,800.00	4,300.00
Fixed expenses		
Interest on investment[1/] or carrying charge at 7 percent	214.88	251.63
Taxes	18.00	20.00
Operating overhead and risk	90.00	100.00
Total fixed expenses per year	322.88	371.63
Fixed expenses per 6-hour day (200 days per year)	1.61	1.86
Depreciation of tractor[2/] per day	5.70	6.45
Total fixed expenses per day	7.31	8.31
Fixed expenses per hour (6-hour day)	1.22	1.38
Running expenses per hour		
Fuel (at $0.13 per gallon)	.203	.255
Lubricating oil (at $0.60 per gallon)	.042	.047
Grease (0.32 pound at $0.16)	.051	.051
Gas to start engine (0.027 gallon at $0.28)	.008	.008
Service labor	.020	.020
Repair parts and labor	.900	1.000
Total	1.224	1.381
Total hourly operating cost	2.44	2.76

1/ Average investment in 1950 = $3,069.72 for D-2 and $3,594.68 for TD-9.
2/ Life = 667 days or 4,000 hours (6-hour days).

Table 11.--Estimated costs per truck used for pulpwood hauling--1½- and 2-ton trucks

Item	Truck: 1½-ton, 105 h.p., 105 h.p.	Truck: 2-ton, 105 h.p., 161-in. wheelbase
	Dollars	Dollars
Investment		
Truck complete with cab, dual wheels, and metal pulpwood rack	2,058.00	2,551.00
Minus tires[1]	- 627.28	- 627.28
Net investment	1,430.72	1,923.72
Minus truck trade-in value	- 450.00	- 600.00
Amount to be depreciated	980.72	1,323.72
Fixed expenses		
Interest on investment[2] or carrying charges at 7 percent	85.44	111.50
License and taxes per year	55.25	57.00
Insurance or risk	72.61	91.00
Total fixed expenses per year	213.30	259.50
Fixed expenses per day (200 days per year)	1.07	1.30
Depreciation of truck per day[3]	2.80	3.31
Total fixed expenses per day	3.87	4.61
Fixed expenses per hour (8-hour day), truck only	.48	.58
Running expenses per mile--woods or low-quality road		
Tires--life = 6,000 miles	.105	.105
Gasoline--5 miles per gallon	.056	.056
Oil and grease	.006	.006
Repair labor	.020	.020
Repair supplies	.020	.020
Total	.207	.207
Running expenses per mile--graded dirt or better quality road		
Tires--life = 10,000 miles	.063	.063
Gasoline--9 miles per gallon	.031	.031
Oil and grease	.003	.003
Repair labor	.012	.012
Repair supplies	.012	.012
Total	.121	.121

1/ Cost of tires charged against running expenses.
Front tires 7:50 x 20 = $93.54 each.
Rear tires 8:25 x 20 = $110.05 each.

2/ Average investment = $1,220.56 for 1½-ton truck, $1,592.79 for 2-ton.

3/ Life--1½-ton truck = 350 days, 2-ton truck = 400 days.

Table 12.--Estimated costs for truck used for pulpwood hauling--2½-ton, 8-cylinder, 159-inch wheel base, 5-speed transmission

	Dollars
Investment	
Truck complete with cab, dual wheels, and pallet system	5,208.00
Minus tires[1/]	- 726.34
Net investment	4,481.66
Minus truck and pallet trade-in value	-1,200.00
Amount to be depreciated	3,281.66
Fixed expenses	
Interest on investment[2/] or carrying charge at 7 percent	237.14
License and taxes per year	65.00
Insurance or risk	122.40
Total fixed expenses per year	424.54
Fixed expenses per day (200-day year)	2.12
Depreciation of truck per day--life = 600 days	5.47
Total fixed expenses per day	7.59
Fixed expenses per hour (8-hour day)	.95
Running expenses per mile--woods or low-quality roads	
Tires--life = 6,000 miles	.121
Gasoline--4 miles per gallon	.070
Oil and grease	.007
Repair labor	.025
Repair supplies	.025
Total	.248
Running expenses per mile--graded dirt or better-quality roads	
Tires--life = 10,000 miles	.073
Gasoline--8 miles per gallon	.035
Oil and grease	.004
Repair labor	.015
Repair supplies	.015
Total	.142

1/ Cost of tires charged against running expenses.
Front tires 8:25 x 20 = $110.05 each.
Rear tires 9:00 x 20 = $126.56 each.

2/ Average investment = $3,387.77.

Table 13.--Estimated costs for 3/4-ton pick-up truck used to haul woods crews

	Dollars
Investment	
Truck complete with covered pick-up body	1,748.70
Minus tires[1] 7:00 x 16	- 119.20
Net investment	1,629.50
Minus truck trade-in value	- 300.00
Amount to be depreciated	1,329.50
Fixed expenses	
Interest on investment[2] or carrying charges at 7 percent	76.84
License and taxes per year	22.00
Insurance or risk	44.00
Total fixed expenses per year	142.84
Fixed expenses per day (200-day year)	.71
Depreciation of truck per day--life = 1,000 days	1.33
Total fixed expenses per day	2.04
Fixed expenses per mile of operation	.047
Running expenses per mile	
Tires--life = 12,000 miles	.010
Gasoline--10 miles per gallon	.028
Oil and grease	.002
Repair labor	.008
Repair supplies	.008
Total	.056

1/ Cost of tires charged against running expenses.
Tires 7:00 x 16 all around at $29.80 each.

2/ Average investment = $1,097.70